

1	GCC	TCT	ACC	CTC	AAG	TCT	GGT	TCT	AAG	GAA	GTT	GAG	AAT	CTC	AAG	AAG	CCT	TTC	54
1	A	S	T	L	K	S	G	S	K	E	V	E	N	L	K	K	P	F	18
55	ATG	CCT	CCT	CGG	GAG	GTA	CAT	GTT	CAG	GTT	ACC	CAT	TCT	ATG	CCA	CCC	CAA	AAG	108
19	M	P	P	R	E	V	H	V	Q	V	T	H	S	M	P	P	Q	K	36
109	ATT	GAG	ATC	TTT	AAA	TCC	CTA	GAC	AAT	TGG	GCT	GAG	GAG	AAC	ATT	CTG	GTT	CAT	162
37	I	E	I	F	K	S	L	D	N	W	A	E	E	N	I	L	V	H	54
163	CTG	AAG	CCA	GTT	GAG	AAA	TGT	TGG	CAA	CCG	CAG	GAT	TTT	TTG	CCA	GAT	CCC	GCC	216
55	L	K	P	V	E	K	C	W	Q	P	Q	D	F	L	P	D	P	A	72
217	TCT	GAT	GGA	TTT	GAT	GAG	CAA	GTC	AGG	GAA	CTC	AGG	GAG	AGA	GCA	AAG	GAG	ATT	270
73	S	D	G	F	D	E	Q	V	R	E	L	R	E	R	A	K	E	I	90
271	CCT	GAT	GAT	TAT	TTT	GTT	GTT	TTG	GTT	GGA	GAC	ATG	ATA	ACG	GAA	GAA	GCC	CTT	324
91	P	D	D	Y	F	V	V	L	V	G	D	M	I	T	E	E	A	L	108
325	CCC	ACT	TAT	CAA	ACA	ATG	CTG	AAT	ACC	TTG	GAT	GGA	GTT	CGG	GAT	GAA	ACA	GGT	378
109	P	T	Y	Q	T	M	L	N	T	L	D	G	V	R	D	E	T	G	126
379	GCA	AGT	CCG	ACG	TCT	TGG	GCA	ATT	TGG	ACA	AGG	GCA	TGG	ACT	GCG	GAA	GAG	AAT	432
127	A	S	P	T	S	W	A	I	W	T	R	A	W	T	A	E	E	N	144
433	AGA	CAT	GGT	GAC	CTC	CTC	AAT	AAG	TAT	CTC	TAC	CTA	TCT	GGA	CGA	GTG	GAC	ATG	486
145	R	H	G	D	L	L	N	K	Y	L	Y	L	S	G	R	V	D	M	162
487	AGG	CAA	ATT	GAG	AAG	ACA	ATT	CAA	TAT	TTG	ATT	GGT	TCA	GGA	ATG	GAT	CCG	CGG	540
163	R	Q	I	E	K	T	I	Q	Y	L	I	G	S	G	M	D	P	R	180
541	ACA	GAA	AAC	AGT	CCA	TAC	CTT	GGG	TTC	ATC	TAT	ACA	TCA	TTC	CAG	GAA	AGG	GCA	594
181	T	E	N	S	P	Y	L	G	F	I	Y	T	S	F	Q	E	R	A	198
595	ACC	TTC	ATT	TCT	CAT	GGG	AAC	ACT	GCC	CGA	CAA	GCC	AAA	GAG	CAT	GGA	GAC	ATA	648
199	T	F	I	S	H	G	N	T	A	R	Q	A	K	E	H	G	D	I	216
649	AAG	TTG	GCT	CAA	ATA	TGT	GGT	ACA	ATT	GCT	GCA	GAT	GAG	AAG	CGC	CAT	GAG	ACA	702
217	K	L	A	Q	I	C	G	T	I	A	A	D	E	K	R	H	E	T	234
703	GCC	TAC	ACA	AAG	ATA	GTG	GAA	AAA	CTC	TTT	GAG	ATT	GAT	CCT	GAT	GGT	ACC	GTT	756
235	A	Y	T	K	I	V	E	K	L	F	E	I	D	P	D	G	T	V	252
757	TTG	GCT	TTT	GCT	GAT	ATG	ATG	AGA	AAG	AAA	ATT	TCT	ATG	CCT	GCA	CAC	TTG	ATG	810
253	L	A	F	A	D	M	M	R	K	K	I	S	M	P	A	H	L	M	270
811	TAT	GAT	GGC	CGA	GAT	GAT	AAT	CTT	TTT	GAC	CAC	TTT	TCA	GCT	GTT	GCG	CAG	CGT	864
271	Y	D	G	R	D	D	N	L	F	D	H	F	S	A	V	A	Q	R	288
865	CTT	GGA	GTC	TAC	ACA	GCA	AAG	GAT	TAT	GCA	GAT	ATA	TTG	GAG	TTC	TTG	GTG	GGC	918
289	L	G	V	Y	T	A	K	D	Y	A	D	I	L	E	F	L	V	G	306
919	AGA	TGG	AAG	GTG	GAT	AAA	CTA	ACG	GGC	CTT	TCA	GCT	GAG	GGA	CAA	AAG	GCT	CAG	972
307	R	W	K	V	D	K	L	T	G	L	S	A	E	G	Q	K	A	Q	324
973	GAC	TAT	GTT	TGT	CGG	TTA	CCT	CCA	AGA	ATT	AGA	AGG	CTG	GAA	GAG	AGA	GCT	CAA	1026
325	D	Y	V	C	R	L	P	P	R	I	R	R	L	E	E	R	A	Q	342
1027	GGA	AGG	GCA	AAG	GAA	GCA	CCC	ACC	ATG	CCT	TTC	AGC	TGG	ATT	TTC	GAT	AGG	CAA	1080
343	G	R	A	K	E	A	P	T	M	P	F	S	W	I	F	D	R	Q	360
1081	GTG	AAG	CTG	TAG															1092
361	V	K	L	*															

FIG. 1

117 full positional randomization

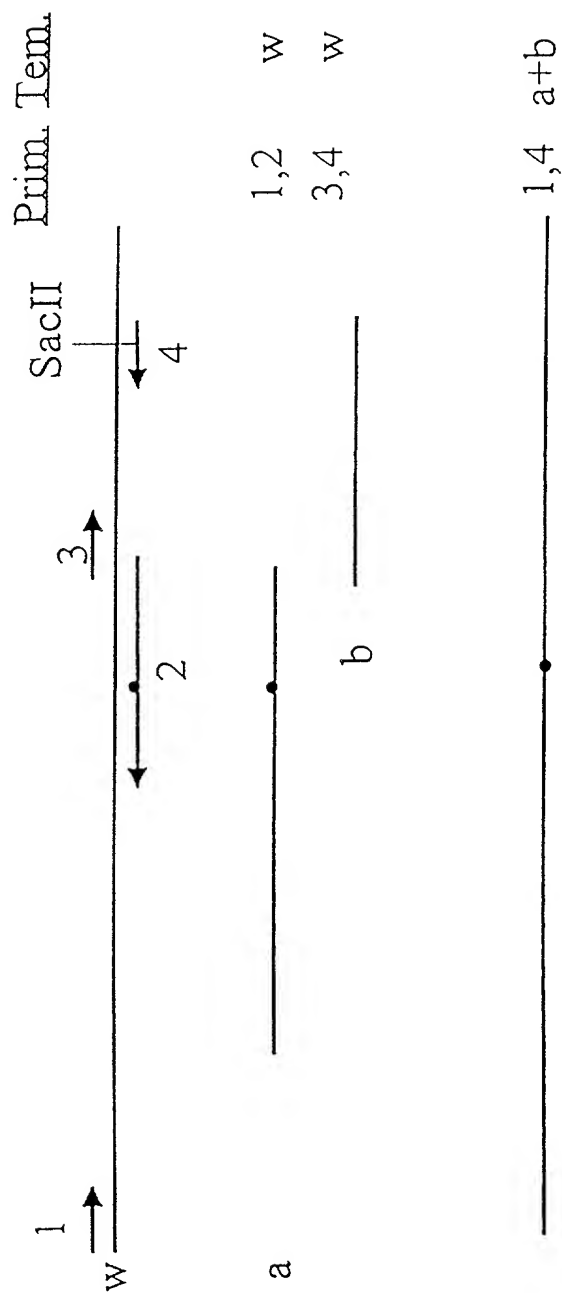


FIG. 2

w is wt sequence
a, and b are fragments
• is NNK codon

Making a combinatorial library with full positional randomization

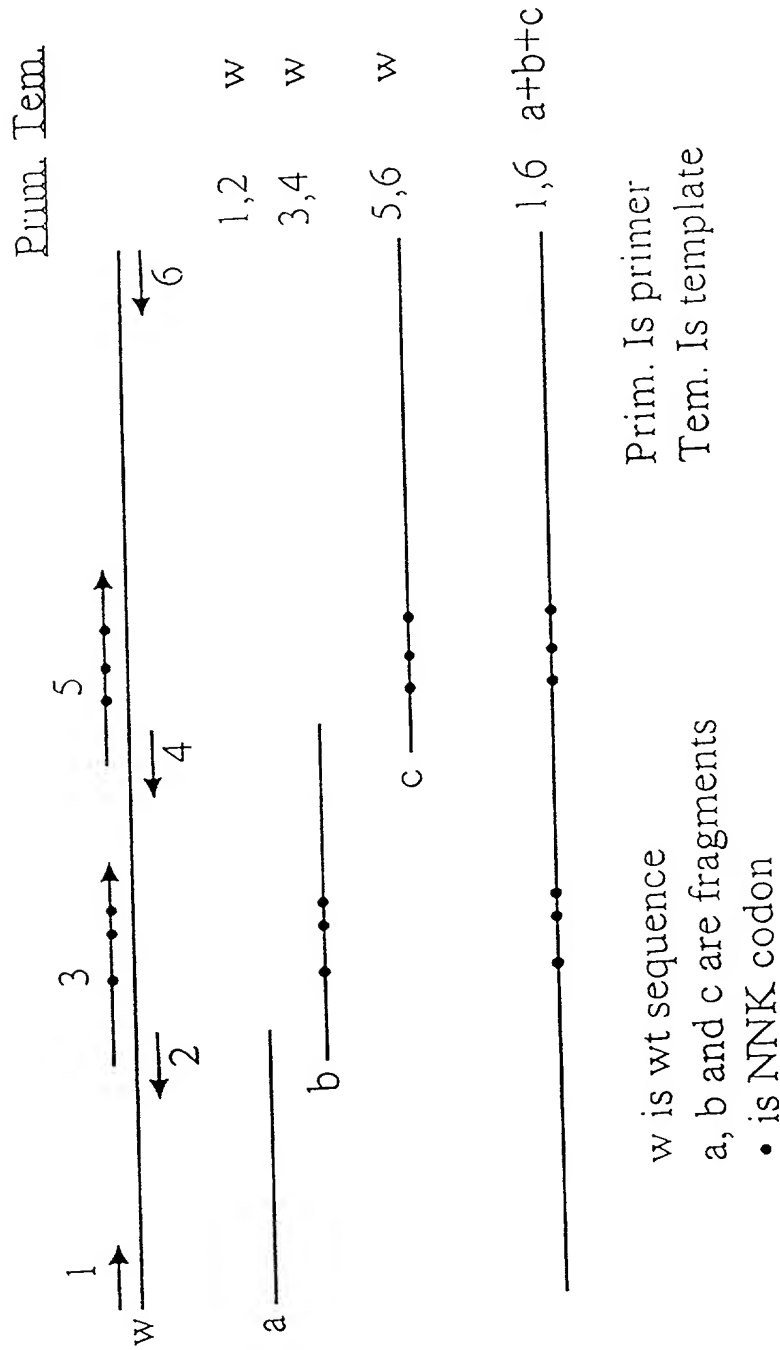


FIG. 3